CLAIMS

1. An engine startup fuel control system for use with an internal combustion engine of the type having at least one combustion chamber, an intake air passage fluidly connected each combustion chamber, a source of fuel, a crankshaft and a camshaft, said fuel control system comprising:

a multipoint fuel injector associated with each combustion chamber, each multipoint fuel injector having an inlet connected to said fuel source and an outlet fluidly connected to said intake air passageway adjacent its associated combustion chamber,

a crankshaft position sensor which generates an output signal representative of the angular position of the crankshaft,

a camshaft position sensor which generates an output signal representative of the angular position of the camshaft,

an engine control unit programmed to determine the synchronization of the engine in response to said output signals from said crankshaft position sensor and said camshaft position sensor,

said engine control unit having outputs which control the activation of each said multipoint fuel injector,

said engine control unit programmed to vary the activation of said multipoint fuel injectors after the determination of engine synchronization to achieve a predetermined air/fuel mixture in each of said combustion chambers.

2. The invention as defined in claim 1 and comprising a cold start fuel injector having an inlet connected to said fuel source and an outlet fluidly connected through a cold start passageway with each combustion chamber, said engine control unit having an output which controls the activation of said cold start fuel injector.

3. The invention as defined in claim 2 wherein said ECU determines the air/fuel mixture introduced by said cold start fuel injector into each combustion chamber during startup.

4. The invention as defined in claim 1 wherein the engine control unit is programmed to begin activation of said multipoint fuel injectors only after a predetermined rotary speed of the main shaft during engine startup.

5. The invention as defined in claim 1 and comprising means for storing said crankshaft position sensor output signal and said camshaft position sensor output signal in memory storage means at engine shutoff.

6. The invention as defined in claim 5 wherein said engine control unit determines synchronization of the engine by reading said stored crankshaft position sensor output signal and said stored camshaft position sensor output signal from said memory storage means.

7. The invention as defined in claim 1 wherein said internal combustion engine is a four-cycle internal combustion engine.

8. An engine startup fuel control system for use with an internal combustion engine of the type having at least one combustion chamber, an intake air passage fluidly connected each combustion chamber, a cold start fuel passageway having an inlet and an outlet, the cold start fuel passageway outlet being fluidly connected to the combustion chambers and a source of fuel, said fuel control system comprising:

a crankshaft position sensor which generates an output signal representative of the angular position of the crankshaft,

a camshaft position sensor which generates an output signal representative of the angular position of the camshaft,

a multipoint fuel injector associated with each combustion chamber, each multipoint fuel injector having an inlet connected to the fuel source and an outlet fluidly connected to said intake air passageway adjacent its associated combustion chamber, each said multipoint fuel injector, upon activation, injecting fuel into its associated combustion chamber,

a cold start fuel injector having an inlet connected to said fuel source and an outlet fluidly connected to the inlet of the cold start fuel passageway, said cold start fuel injector, upon activation, introducing a fuel charge into the inlet of the cold start fuel passageway,

processing means programmed to determine the synchronization of the engine in response to said output signals from said crankshaft sensor and said camshaft sensor and for producing a predetermined combustible charge in each combustion chamber during engine startup by selectively activating said multipoint fuel injectors during engine startup and after engine synchronization to provide fuel to each combustion chamber sufficient to compensate for any transport delay of the fuel charge from the cold start fuel injector through the cold start fuel passageway.

9. The invention as defined in claim 8 wherein said processing means initiates activation of said cold start fuel injector and said multipoint fuel injectors at a predetermined rotational speed of said main shaft.

10. The invention as defined in claim 8 and comprising means for storing said crankshaft position sensor output signal and said camshaft position sensor output signal in memory storage means at engine shutoff.

11. The invention as defined in claim 10 wherein said engine control unit determines synchronization of the engine by reading said stored crankshaft position sensor output signal and said stored camshaft position sensor output signal from said memory storage means.

12. The invention as defined in claim 8 wherein said internal combustion engine is a four-cycle internal combustion engine.

13. A method for managing fuel delivery in an internal combustion engine having multiple combustion chambers during engine startup, said engine having a crankshaft, a camshaft and a multipoint fuel injection associated with each combustion chamber, said method comprising the steps of:

determining the angular position of the crankshaft,

determining the angular position of the camshaft,

thereafter calculating the required activation of the multipoint fuel injectors to achieve a predetermined air/fuel mixture in said combustion chambers, and

thereafter selectively activating said multipoint fuel injectors in response to said calculating step to achieve said predetermined air/fuel mixture in at least one combustion chamber.

14. The invention as defined in claim 13 and comprising the steps of storing said angular position of said crankshaft and said camshaft in memory storage means at engine shutdown.

15. The invention as defined in claim 14 wherein said calculating step comprises the step of reading said stored angular positions from said memory storage means.

16. The invention as defined in claim 13 wherein the internal combustion engine includes a cold start fuel injector and comprising the step of activating the cold start fuel injector after the engine crankshaft exceeds a predetermined rotary speed.

17. The invention as defined in claim 13 wherein said activating step comprises the step of activating the multipoint injectors during an intake stroke of the combustion chamber.

18. The invention as defined in claim 13 wherein the engine includes a cold start fuel injector and comprising the step of activating the cold start fuel injector when the rotational speed of the engine exceeds a predetermined amount.